

U. S. Bureau of Reclamation

Great Plains Region

Water Conservation Field

Services Program

- Part II -

FY2002 Program Activity

Highlights

Background -

'The Mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.'

The Reclamation Program was created by the Reclamation Act of 1902 to reclaim the arid West and to provide economic stability in the 17 western states by developing irrigation projects. Over time, these single purpose projects gave way to the development and construction of multipurpose water resource projects with increasingly greater emphasis placed on the efficient use of developed water supplies, the protection of societal and environmental values, and the protection of the Federal investment and its infrastructure.

In 1996, Reclamation initiated the Water Conservation Field Service Program (WCFSP) to encourage water conservation and efficient use of water supplies on Federal Reclamation projects, as well as foster improved water management on a watershed basis throughout the western states.

The purpose of the WCFSP is to actively encourage water conservation, assist irrigation and other water districts in developing and implementing water conservation plans, and complement and support other state and local conservation efforts. In addition, it helps Reclamation fulfil other obligations under other Federal directives, i.e., Fish and Wildlife Coordination Act of 1958 and the Endangered

Species Act of 1973. It provides Reclamation the opportunity to broaden partnerships with other Federal and non-Federal agencies in fostering improved watershed management.

While the program emphasis under RRA is to work with Reclamation projects, the WCFSP is also designed to contribute to watershed management partnerships outside of Reclamation projects in order to improve fish and wildlife habitat associated with water systems or water supplies affected by Reclamation projects.

The Great Plains Region administers Reclamation projects in Montana, North and South Dakota, Colorado, Wyoming, Nebraska, Kansas, Oklahoma and Texas and has a great diversity of irrigation and non-irrigation related constituents. In addition to irrigation districts, Area Office WCFSP Coordinators work with tribal entities, rural water systems, non-profit organizations and municipalities on water management and conservation issues.

Area, Regional, and Denver offices provide technical and financial assistance in the four emphasis areas of the WCFSP:

- Conservation planning
- Conservation education
- Demonstration of innovative conservation technologies
- Implementation of conservation measures.

Following is a summarization of selected activities undertaken by program partners and Reclamation in FY 2002. The activities are organized by the four program emphasis areas.

— Conservation Planning —

DKAO - Conservation Plan Development -

- DKAO encouraged water districts to develop and implement water conservation and management plans. Technical assistance and guidance was offered to all interested water users in preparing conservation plans. Seven conservation plans from irrigation entities and six from municipal and rural water entities have been received and commented on by DKAO. Of the ten irrigation entities in the Dakotas receiving Reclamation water, only three are required to submit plans under RRA.

DKAO - Rural Water Systems -

- DKAO is involved in the planning, design, construction, operations and maintenance of numerous rural water systems in North Dakota and South Dakota. Project sponsors of these systems are required or encouraged to develop a water conservation plan. DKAO staff will review these plans and discuss potential modifications.



Installing water line on the Mni Wiconi Rural Water System, SD.

DKAO worked with the South Dakota Association of Rural Water Systems (SDARWS) and North Dakota Rural Water Systems Association (NDRWSA) to provide training, technical assistance, and develop educational programs for the rural water distribution systems.

ECAO - Arkansas Valley Salinity Study - Colorado State University (CSU) -

- This cost-sharing project educates irrigators and water managers in the Arkansas Valley about salinity and waterlogging problems and their solutions through field days and workshops. Project findings will be disseminated through appropriate venues and the interaction and feedback of decision-makers will be sought. Efforts will be made to gain direct input in the development of alternative solutions for consideration in CSU model development.



ECAO - South Platte Basin Salinity Study – Northern Colorado Conservancy District (NCCD)-

- This project entails a six-year data collection

effort of salinity within NCCD boundaries. NCCD's Irrigation Management Service (IMS) group will be collecting water and soil samples. They will also be using the dual EM-38 to determine levels of salinity within fields. Project findings will be disseminated through appropriate venues and the interaction and feedback of decision-makers will be sought.

MTAO - Canal Efficiency Study - Milk River Project –

- Through a cooperative agreement, MTAO provided technical and financial assistance to initiate a study to develop a water budget and



Hydraulic Technicians conduct a discharge measurement as part of the Milk River Canal Efficiency Study.

determine canal efficiencies of the 120,000 acre Milk River Project. Study will identify problem areas and provide the Project with potential solutions.

MTAO – Muddy Creek Watershed Assessment -

- MTAO worked with local watershed group, Greenfields Irrigation District, and Montana State University Extension Service to conduct a watershed assessment of Muddy Creek. The goal is to identify major contributors to the flow in Muddy Creek with the long term goal to identify potential reductions to the flow.

MTAO - Buffalo Rapids Canal Conveyance Automation Potential Assessment -

- MTAO provided funding to the Buffalo Rapids Joint Board of Control to hire a contractor to assess their conveyance system for automation potential. The Contractor is working with the District to prioritize their automation needs and to develop an implementation plan.

NKAO - Conservation Plan Development -

- NKAO's priority was to work with irrigation districts to update water conservation plans. NKAO continues to provide assistance in reviewing and updating water conservation plans for 12 Reclamation Irrigation Districts. NKAO has also provided planning assistance to private irrigation districts.

NKAO - Water Supply Contract Renewals – Republican River Basin – Solomon River Basin

- Water conservation commitments made by irrigation districts in the Republican and Solomon River basins in order to receive 40 year contracts. NKAO has provided technical and financial assistance to these districts in order to meet system and on-farm efficiency goals set by these commitments. NKAO and these Districts hold annual operations meetings to discuss current year operations, historic operations, completed and planned conservation measures, and future water supplies and system improvements.

WYAO - State Water Conservationist Position - Wyoming Water Development Office -

- This is the sixth year of a cooperative effort between the State of Wyoming and Reclamation to improve water management and conservation within the state. Wyoming has an interest in the success of the WCFSP, and the Wyoming Water Development Office (WWDO) has significant expertise in the area of water management improvements, evaluations, etc. This effort will reduce duplication of efforts and provide for a larger technical resource pool to draw from. Also, it is anticipated WWDO will be capable of working most efficiently with water users in providing assistance in developing and implementing water conservation plans.

OTAO - Central Oklahoma Master Conservancy District -

- The WCFSP provided funding assistance for Reclamation staff in Denver visit the project and to complete a report which provides recommendations associated improving flow measurement within the district's

conveyance system.

OTAO - City of Wichita, Kansas -

- The City was provided financial assistance to update the City's current WCP and identify new measures planned for implementation over the next 5 years. The City has also agreed to make the plan available for public review on their web site, www.wichitago.org.

OTAO - Lugert-Altus Irrigation District -

- The WCFSP provided funding for Reclamation staff in Denver to visit the project and complete a report which estimates water savings, project costs and provides design recommendations associated with conversion of approximately 45 laterals to low pressure pipeline delivery over the next 5 years.

OTAO - Tom Green Water Control and Improvement District #1 -

- Financial assistance was provided to the district to hire a consultant to prepare a report and identify potential options associated with providing remote monitoring and automation capability within the district.



— Conservation Education —

DKAO – Education Activities -

- The DKAO offers financial assistance to water entities who wish to participate in education and training activities related to water management, and water operations. Approximately 10 people received financial assistance through the DKAO WCFSP to attend training conducted by Reclamation.
- DKAO has agreements with North Dakota State University (NDSU) and South Dakota State University (SDSU) to provide educational information and activities to Reclamation water users. The activities

included workshops and field-days as forums to discuss irrigation management, irrigation scheduling, estimating crop water use, and improving irrigation efficiencies.

- SDSU has installed and renovated weather stations in Reclamation Irrigation Districts with funding provided by DKAO. SDSU used the weather stations to develop and disseminate crop water use information through web sites which will be developed specific to each irrigation district. Plans are to provide soils, water, cropping information, and maps to producers through internet web sites.
- DKAO sponsors and participates in annual water conventions in North Dakota and South Dakota in cooperation the South Dakota Association of Rural Water Systems and North Dakota Rural Water Systems Association.



Bismarck, ND, "Annual NDRWSA Convention."

DKAO - Water Festivals -

- DKAO participates in Children's Water Festivals in North Dakota and South Dakota as an opportunity to educate elementary grade students in all facets of water.



- Teaching about Reclamation dams, water conservation, and letting kids build a dam.

ECAO - Water Festivals – Northern and Southeastern Colorado Conservancy Districts and Local Municipalities -

- A Children's Water Festival is an opportunity to educate 4th and 5th grade students in all facets of water. Reclamation has helped to financially sponsor about 7,000 students along the Front Slope of Colorado.



Water Festival Activity Boulder, CO

ECAO - Watershed - Boulder Creek Watershed Initiative -

- This project helps protect the water resources of the Boulder Creek Watershed by providing opportunities for local students and adults to participate in monitoring, cleaning, and restoring local streams and wetlands.

ECAO - Family Water Festival - Colorado Springs Utilities -

- Financial assistance provided to the City of Colorado Springs Utilities for a family based water festival. In 2001, attendance was approximately 4,000 people.

ECAO - Rain gauges in Northern Colorado - Colorado Climate Control -

- This program gives the community in

Northern Colorado an opportunity to learn more about their local weather. This is accomplished by providing participants with ECAO sponsored rain gauges. They report to the Colorado Climate Control Center in Fort Collins, any precipitation that occurs throughout the year.

ECAO - Learn to Be Water Wise - National Energy Foundation -

- This program is targeted for 4th or 5th grade students. They are provided a kit containing water saving devices and education on water conservation. This program reaches over 7,000 students statewide.

ECAO - Discovery Center Science Museum Water Exhibit - Fort Collins Water Utilities -

- Through a cooperative agreement, a display of the water cycle will be developed and installed in northern Colorado. A control panel with questions and answers will be associated with the display to further enhance knowledge of the water cycle.

ECAO - WCFSP Resource Center -

- The center has water management information, videos, posters, books, publication, and water conservation tokens and prizes, and all is available to the public.



Display of tokens with Otto Otter

MTAO - Milk River Watershed News -

- In cooperation with the Montana Department of Natural Resources and Conservation, MTAO sponsors a quarterly newsletter that is mailed to irrigators in the Milk River Project, along with local, state, and Federal officials, sportsman's groups, and other local citizens. Newsletter is designed to provide timely information to basin residents on issues that have the

potential to impact them.

MTAO - Water Use Efficiency Education -

- MTAO partnered with Montana State University Extension Service to provide water use efficiency education through newsletters, workshops, and field visits. The education is tied to areas that participate in Reclamation's AgriMet network.

NKAO - Children's Groundwater Festival -

- NKAO is a major sponsor of the Children's Groundwater Festival, which is held annually in Grand Island, NE. 2002 was the 14th year of the festival, which has been used as a model for other states and countries to develop other festivals. Over 3000 grade school children attend the festival each year to learn about groundwater and associated water resources. Reclamation provides funding assistance through the Groundwater Foundation and hosts a presentation each year at the festival.



Reclamation's Jeff Peterson performs a magic trick with a nervous volunteer (Nebraska Governor Mike Johanns). Jeff incorporates magic tricks while teaching students the importance of water conservation.

NKAO - Project WET (Water Education for Teachers) -

- Project WET is an interdisciplinary water education program to advise and promote the awareness, appreciation, knowledge, and stewardship of water resources. Recently Project WET has expanded to supply education seminars to upper level college students who will soon be entering the educational field. The NKAO provides assistance to the Nebraska 4-H Development Foundation for support of Project WET, along

with the University of Nebraska Cooperative Extension, the Nebraska Forest Service, and the Nebraska Game & Parks Commission.

NKAO-OTAO – Great Plains Foundation -

- The NKAO combined with the OTAO in providing funding assistance to The Great Plains Foundation for assisting with the Foundation's annual water symposium. The 2002 Festival titled "Protection and Utilization of Air and Water Resources of the Great Plains" was held at the Texas A&M University Agricultural Research and Extension Center in Amarillo, Texas.

NKAO – Surge Irrigation Training -

- The NRCS, the University of Nebraska Extension Service, and the NKAO provided surge valve and surge irrigation training for Irrigation District and private irrigators in the Republican River Basin. This training was held in conjunction with the popular surge valve loaner program that the NKAO has been sponsoring with the Irrigation Districts, NRCS, and NRDs.

NKAO – Pipe Measurement Video -

- Reclamation's NKAO and Water Resources Research Lab worked with the NRCS and the University of Nebraska Extension Service to produce an instructional video titled "Irrigation Flow Measurement in Pipe Systems". This video provides information on the importance of water measurement and the selection, installation, and operation and maintenance of water measurement devices in piped systems.

NKAO – Flowmeter Testing and Field Operator Training Facility -

- The NKAO provided technical and funding assistance through agreement with the Kansas Division of Water Resources (KDWR) for the installation of a Flowmeter Testing and Field Operator Training Facility at the University of Kansas (KU). This facility will provide the KDWR and KU a traceable, defensible, flow measurement standard, which the KDWR can use to facilitate the compliance monitoring of groundwater usage throughout the state of Kansas. Reclamation's Water Resources Research Laboratory provided technical assistance for the design of the facility, which should be completed in early 2003.

NKAO – Mid-High Plains Education Initiative -

- NKAO provides assistance to the Groundwater Foundation to for the Mid-High Plains Education Initiative. This project's initial target was to continue water resource discussions between all interests, with the first area of focus being the Republican River Basin. Participating groups include irrigation districts, natural resource districts, groundwater guardian groups, public power agencies, university educators, private irrigators, and other local, state, and federal agencies.

WYAO - Water Conservation Education Program - Laramie County Conservation District -

- Reclamation provided financial assistance to the Laramie Conservation District (LCCD) to develop a Water Conservation Education Program. The LCCD currently offers many environmental education programs for grades K-12 and beyond. Funding from this grant request will enable the LCCD to develop and implement a water conservation program.

WYAO - Wyoming Project WET - Teton Science School -

- Project WET (Water Education for Teachers) is a national nonprofit water education program for educators and students, grades K-12. Reclamation provided funds for the purchase of manuals and books.

WYAO - Children's Water Festival - Central Wyoming Regional Water System -

- A cooperative agreement between Reclamation and the Central Wyoming



Regional Water System provided funds to assist in the 2002 Wyoming State Children's Water Festival. The Festival provided a unique opportunity to inform large numbers of school children distributed over a large geographic area, of the importance of protecting water resources, responsible water

use, and pro-active pollution prevention. This year's festival attracted over 1,500 4th and 5th grade students from all over the state. Students were able to learn about reservoir uses at a display purchased with a grant from Reclamation. The 3-dimensional cross-section of a dam and reservoir includes a panel that lists names and functions of the various reservoir elements.

WYAO - Water Education Calendar - Utah State University, International Office for Water Education -

- WYAO was part sponsor in the purchase of water education calendars. The calendars contain water-related artwork created by elementary students, and include questions and facts about water. The calendars assist teachers and students in gaining a better understanding of the role water plays in our lives and how we can help deal with future problems.

WYAO - Water Conservation Connection, Natural Science Program - University of Wyoming, College of Education -

- Reclamation entered into a grant agreement for the sponsorship of the Wyoming Conservation Connection Program to promote the education of water conservation principles to Wyoming school children and teachers. 2002 was the fourth year Reclamation has sponsored this program.

WYAO – Using the Landscape as a Classroom, Introduction to Rangeland Perspectives - Wyoming Agriculture in the Classroom -

- Reclamation provided funding to Wyoming Agriculture in the classroom. Wyoming



Agriculture in the Classroom is working to increase K-12 teachers and students knowledge of the benefit, function, and management of watersheds and riparian zones through a consensus-based decision-making workshop for educators.

WYAO – Educational Display - Natrona County

Conservation District -

- Funds were provided to purchase a background display for the Natrona County Conservation District. The display will encourage awareness of new and existing technologies and provide information in efficient water usage and why conservation is increasingly a critical concern facing Wyoming citizens. The educational campaign will provide an opportunity for the public to become more informed and aid them in making wise future decisions when faced with water resource issues.

GPRO – International Project WET – Publication of Discover a Watershed – Watershed Manager Workbook –

- The Great Plains Regional Office provided financial assistance to International Project WET at Montana State University to develop and print the Watershed Manager's workbook. This publication was targeted for teachers and others involved with water management. Workbook presents issues that can occur in watersheds, including competing priorities for water demands.

OTAO - Earth Awareness Researchers for Tomorrows Habitat (EARTH) –

- The Extension Education Foundation, Inc. was provided a funding grant in FY02 to print EARTH curriculum notebooks, purchase program supplies, equipment rental, and transportation to assist in funding EARTH's 2002-2003 educational program. The EARTH program is a unique educational approach, which promotes prevention and education for local Wichita, KS youth as a way of protecting the watershed and the groundwater. The



EARTH goal is to provide youth with innovative, experiential learning opportunities that highlight the relationships and interdependence of our natural resources and encourage the development of skills that will help local children become wise stewards of

their environment. During the 2002 school year, EARTH served 1,735 students taught by 17 teachers in six schools. The end of the year workshop was attended by over 1,200 students, 80 presenters, 130 high school volunteers, and 20 adult volunteers.

OTAO - Great Plains Foundation -

- In FY2002 the OTAO and NKAO each provided financial assistance to help produce the 2002 symposium.

OTAO - Irrigation District Field Trip to California's Central Valley -

- In the spring of FYO2, OTAO sponsored a field trip for irrigation district managers and staff from Texas and Oklahoma to tour four



irrigation districts in California's Central Valley. The objective of the trip was to provide first-hand knowledge to irrigation district managers of new and innovative water management techniques used in the operation and maintenance of irrigation facilities in California. This trip was conducted in conjunction with Reclamation's Northern California Area Office in Willows, CA.

OTAO - Learning-to-be-Waterwise -

- In FY2002, the area office provided 50% cost-share funding to the City of Corpus Christi, City of San Angelo, City of McAllen, and Foss Reservoir Master Conservancy District to encourage these municipal water suppliers to fund water conservation education as part of implementation of their water conservation plans. Each of these water users choose to implement the "Learning to be Waterwise" program, developed for grades 4-8 by the nonprofit National Energy Foundation. The Learning to be Waterwise program is a "learn-by-doing" program that teaches 4th-8th graders and their parents about the water cycle and explores sources, uses and conservation of water. Students work with

their parents to learn about their own home water use, while installing technologies from their resource action kits to save water, energy, and money on utility bills.

OTAO - Project WET -

- Funding was provided to distribute 1000 copies of *Discover a Watershed: The Rio Grande/Rio Bravo Reference and Educators Guides* and 10,000 copies of the *Discover a Watershed: The Rio Grande/Rio Bravo KIDS Activity Booklet* at the 46th Annual Conference for the Advancement of Science Teachers (CAST 2002) held this past November 7-9,



2002, in El Paso, Texas. Distribution of the Project WET teacher guides and kids activity booklets at CAST 2002 Annual Conference helps to promote the instruction of water conservation principles to Texas school children and teachers.

— Conservation Technology Demonstration —

MTAO - Hillside Ditch Standardized Turnouts -

- MTAO provided funding to the Paradise Valley Irrigation District to install standardized individual farm turnouts to producers on one of their major laterals. A total of 20 turnouts were installed. The District also has a measuring device at the head and terminus of the lateral.

MTAO - Vandalia Diversion Dam Remote Operation -

- MTAO provided funding to the Glasgow Irrigation District to install remote operating capability at their canal headworks. This will allow the District to better match their diversions from the Milk River with their irrigation demands.

DKAO - Demonstration Activities -

- DKAO has agreements with SDSU and NDSU to demonstrate and evaluate innovative conservation technologies to water users. Surge valves, mini-center pivots, and alternative crops with lower water requirements are some of the technologies being demonstrated in South Dakota. NDSU designed and constructed one floating and one submerged low water pump intake structure and are demonstrating them on the Heart River. NDSU has also adapted an irrigation scheduling program for handheld computers (Palm format) and demonstrated it to farmers and installed a variable speed pump controller at the NDSU Research Extension Center in Carrington to demonstrate the technology to irrigators.



Floating low water intake designed, constructed and demonstrated by NDSU for the Heart River Irrigators (note worn pump bowl from pumping sand with previous intake).

DKAO - Canal Sealant and Seepage Reduction Demonstration Project –

- A cooperative agreement for conservation demonstration and implementation with Buford-Trenton Irrigation District, ND has allowed the demonstration of a spray-on canal sealant to reduce canal seepage. Irrigation districts cannot afford the expense of lining large canals, or replacing canals with pipelines, without substantial financial



assistance. The use of a spray-on canal sealant to reduce canal seepage may be a cost effective alternative for districts to consider.

Custom built, large volume sprayer built to apply canal sealant. Boom extends across entire canal.

DKAO - Xeriscape Landscape Demonstration – Fargo, ND -

- DKAO has a cooperative agreement with the City of Fargo, ND to conduct a landscape water conservation demonstration. Data is being compiled and analyzed comparing conventional lawn water use to Xeriscape landscapes.



Home of a Fargo Xeriscape study participant.

DKAO - Xeriscape Gardens -

- Xeriscape demonstration and educational gardens are being developed in cooperation with the cities of Fargo, ND and Rapid City, SD. The gardens will educate local landowners about the type of plants and landscape materials available to incorporate in their own lawns. A variety of local entities contributed time and funds to the garden. The Fargo Xeriscape education and demonstration garden has been constructed.



Fargo Xeriscape education and demonstration garden.

ECAO - Xeriscape Demonstration - Metro Water Conservation, Inc -

- In cooperation with Reclamation's Washington and Denver Offices, continued participation in one of five Water Conservation Challenge Grants. This six year cost-sharing agreement with the MWCI is to conduct a landscape water conservation demonstration. Data will be collected, compiled, and formatted for use in a broader framed analysis. Participants include the cities of: Fort Collins, Boulder, Colorado Springs, Arvada and Denver. Study will end in 2002.

ECAO - Xeriscape Garden – Southeastern Colorado Conservancy District -

- The xeriscape garden is the first of its kind in the Pueblo area. This garden educates local users about the type of plants and hardscape to incorporate in their own lawns. The garden is located at the SE headquarters. A variety of local entities contributed time and funds to the garden.

ECAO - Evapotranspiration rates for Xeriscape plants – Northern Colorado Conservancy District -

- This project monitors the growth and water usage of 45 typical landscape plants (15 species with three replications of each). Weekly measurements are taken of the amount of water used, with daily observation of two species at a time, rotated through out the growing season to obtain daily data. The plants would be established in the drainage lysimeters and the measured area covered by the plants would be related to an equivalent coverage area of turfgrass. We can then estimate by the size of plant the amount of water being used compared to turfgrass. The project will be completed after the 2002-growing season.

NKAO – Limited Irrigation Management Strategies -

- Reclamation has been providing financial assistance to the University of Nebraska since 1996 for a Limited Irrigation Strategies study in the Republican River Basin. The project demonstrates implications of alternative irrigation management strategies on water use and profitability. Four different irrigation management strategies have been conducted at each six sites, current farmer management, university best management

practices, late initiation, and limited allocation. Interest in this study has been high due to groundwater pumping restrictions in the Upper Republican Natural Resource District (NRD) and the groundwater metering measures implemented by the Middle and Lower Republican NRDs.



NKAO – Surge Valve Loaner Program -

- Reclamation works with the Natural Resources Conservation Service (NRCS), the local Natural Resource District, the University of Nebraska Extension Service, and various Irrigation Districts to educate and assist the irrigators with field setup, operation, and programming of surge valves. District irrigators can use a Reclamation provided surge valve free of charge for one year. At the end of the year the irrigator can purchase the valve from the District or return it to the District. The District uses these funds to purchase additional valves that will be used the next irrigation season.

NKAO – Canal Trash Screening Devices -

- NKAO provides financial and technical assistance to the Twin Platte NRD for the demonstration of various canal trash screening devices. Irrigators in the Twin Platte NRD have been reluctant to install water meters or to utilize more efficient methods of irrigation (such as surge, gated pipe, and sprinkler) because they feel that surface water cannot be sufficiently screened. This project provides assistance for various types of canal screening devices used by other canal systems that will be displayed throughout the Twin Platte NRD.

NKAO and WYAO – Elbow Meter Technology -

- The NRCS, Reclamation's Water Resource Research Lab, the Wyoming Area Office, and

the NKAO are working together on a research and demonstration project that will develop and demonstrate an inexpensive elbow meter that will be used to measure pipe flow in the Nebraska panhandle. The WRRL is completing the lab testing of these elbow meters and the field demonstration began in 2002 and will continue in the 2003 irrigation season.



Field demonstration of inexpensive elbow meter in the Mirage Flats Irrigation District.

NKAO – Sprinkler Irrigation Demo – KSU -

- The NKAO provided financial assistance to Kansas State University (KSU) for a sprinkler irrigation demonstration project in the Kansas Bostwick Irrigation District No. 2. The demonstration will compare water use efficiency between sprinkler and furrow irrigation, scheduling sprinkler irrigation applications for corn and soybeans, tillage effects on water use and infiltration, uniformity of water delivery, and fertilizer and pesticide delivery through sprinkler systems.

NKAO - Subsurface Drip Irrigation - University of Nebraska, West Central Research and Extension Center – North Platte -

- This project will demonstrate the potential for using subsurface drip irrigation (SDI) to improve water management and conserve the limited water supplies in southwest Nebraska. Information from this demonstration will be presented in technical



papers, conferences and seminars, and field demonstration days.



Installation of Subsurface Drip Irrigation system.

WYAO - Subsurface Drip Irrigation - University of Nebraska, Panhandle Research and Extension Center -

- This project will demonstrate the potential for using subsurface drip irrigation (SDI) to improve water management and conserve surface water supplies in the North Platte River Valley. It will aid the public in developing knowledge on the installation, use, and maintenance of a SDI system in the local area, and provide irrigators an opportunity to observe the SDI in a field setting.

WYAO – Subsurface and Surface Drip Irrigation - University of Wyoming, Powell Research and Extension Center -

- This project at the University will demonstrate potential benefits of both surface and subsurface drip irrigation to improve water management and conserve increasingly limited water resources. The demonstration landscape planting with drip irrigation will be designed to foster the principles of low maintenance, decreased water inputs to the general public, and to encourage the adoption of plant species adapted to the climatic extremes of northwest Wyoming.

WYAO - Small Scale Agricultural Irrigation

Efficiency Improvement Demonstration and Education Program - Hot Springs County Conservation District -

- Reclamation provided financial assistance through a cooperative agreement to Hot Springs Conservation District, to conduct a small-scale agricultural irrigation demonstration and education program. The project will involve the design, installation, and monitoring of a lateral pivot. The program will encourage the awareness of new and existing technologies and help producers improve irrigation efficiency by providing information and education through workshops, demonstration sites, and publications.

WYAO - Big Horn Basin Irrigation Water Management Program - Washakie County Conservation District -

- Reclamation provided funds to the Washakie County Conservation District to continue and improve the Big Horn Basin Irrigation Water Management Program. The program provides local residents in three counties with technical assistance, information, and education through workshops, demonstration sites, and publications. This program also gives school students the opportunity to learn first hand, in the field, how production agriculture uses modern technology to assist in efficient water usage and why conservation is increasingly a critical concern facing Wyoming citizens.

WYAO - Xeriscape Demonstration - University of Wyoming Cooperative Extension Service -

- The WYAO through a cooperative agreement funded the University of Wyoming Cooperative Extension Service for the construction of several high profile xeric landscapes for demonstration/educational purposes. The program is planned to have an associated xeric media campaign using radio/TV/newspaper to increase public knowledge and awareness about efficient water use in the landscape. Also planned is development of an educational mobile display which will highlight xeriscape principals, and a regional xeriscape conference.

WYAO - Surge-Valve Demonstration Program -

University of Nebraska, Panhandle Research and Extension Center -

- Through a cooperative agreement, Reclamation provided funds to the university for providing demonstrations to water user entities of surface-irrigation water conservation techniques, including surge irrigation water management. These demonstrations will help water users identify conservation measures to include and implement in their water conservation plans.

OTAO – Leak Detection Funding -

- Financial assistance was provided to the City of Corpus Christi, City of San Angelo, City of Wichita, Arbuckle Master Conservancy District, Fort Cobb Master Conservancy District, Central Oklahoma Master Conservancy District, Mountain Park Master Conservancy District, Foss Reservoir Master Conservancy District, and Canadian River Municipal Water Authority to assist with purchase of leak detection equipment and aerial surveys to help locate conveyance system leaks.

OTAO - Lugert-Altus Irrigation District -

- The OTAO made a commitment in FY02 to expand Reclamation's ability to provide digital mapping and geographic information systems capabilities by purchasing hardware and by hiring an additional staff member. One of the first projects undertaken by Reclamation's new GIS technician was to update Lugert-Altus Irrigation District's outdated hand-drafted project map and develop a comprehensive digital project map and database of the district. This map is intended to assist the district in water conservation planning and documentation of activities such as conversion of open laterals to pipeline. The map includes topography and aerial photos data layers of the district lands and also identifies canals, laterals, district boundaries, divisions, irrigated lands, turnouts, and earthen and piped laterals.

OTAO - Tom Green Water Control and Imp.

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monitoring and automation will improve the water management of the district by permitting district staff to remotely open gates within the system and monitor canal flow and open gates within the system from the district office. In addition, changes in flows can be made on a timelier basis when compared to manually operated gates.

— Implementation of Conservation Measures —

DKAO – Implementation of Measures -

- DKAO has cooperative agreements with 4 districts to cost-share the implementation of approved conservation measures on approximately 82,000 acres of irrigated farmland. The measures are: implementing water measurement and accounting systems; installing and rehabilitating water measurement structures; calibrating water control structures; purchasing flow measurement equipment; testing pumping plant efficiency and pump performance; replacing open laterals with pipelines; purchasing surge valves and gated pipe; converting from flood irrigation to sprinkler systems; converting sprinkler systems to drop nozzles and lower pressure; rebuilding pumps to provide optimum pressure and field uniformity; utilizing a spray-on canal sealant; providing training to district personnel on water measurement, water district operation and maintenance, and canal operation and automation.



Belle Fourche ID, Angostura Unit, SD - Replacing open lateral with buried pipeline.

DKAO - Bridging-the-Headgate Programs -

- DKAO entered into a "Bridging-the-Headgate" (B-T-H) cooperative agreement with Belle Fourche Irrigation District and Butte County Conservation District

(working through the District Conservationist for the Natural Resources Conservation Service). Agreement is to input project and local utility facilities into a Geographical Information System database; provide technical assistance to the District and local irrigators, and to collect water quality data within the project.

- DKAO also participates in a B-T-H cooperative agreement with North Dakota State University, and the Garrison Diversion Conservancy District to cost-share an Extension Irrigation Specialist. An objective of that agreement is the collaboration on educational and demonstration activities related to water conservation within the state.

ECAO - South Platte Watershed Forum – Northern Colorado Conservancy District and other entities in the South Platte Basin -

- An adult based educational opportunity for interested people. The forum focuses on issues in the South Platte Basin.

ECAO - Arkansas River Basin Watershed Forum - Southeastern Colorado Conservancy District -

- An adult based educational opportunity for interested people. The forum focuses on issues in the Arkansas Basin.

ECAO - Update and Integrate Irrigation Scheduling Program into Web Page - Northern Colorado Conservancy District -

- This project will increase irrigation efficiency, improve water quality through reduced run-off and deep percolation and assist farmers implementing Best Management Practices. By developing a precise soil moisture reference standard for tensiometers; updating in field monitoring and reading of tensiometers; and writing software for farmer's accessibility to web-page to run irrigation scheduling program. The project will be completed in 2002.

ECAO - Best Management Practices (BMPs) within the Purgatorie River Water Conservancy District's Boundaries - Natural Resource Conservation Service (NRCS)/Spanish Peaks and Purgatorie Soil Conservation District -

- Through a cooperative agreement, water conservation and management are being developed and installed on individual farms throughout the PRWCD. Type of BMPs is

land leveling, gated pipe, and surge valves. The program is administered through the local NRCS. In 1996 three farmers participated, the program has reached 55 of the 172 farmers within the district. The farmer provides 40% of cost for improvements.

ECAO - Cooperative Program of Water Resources Data Collection - Southeastern Colorado Conservancy District -

- This program is in cooperation with the USGS. The USGS monitors three water measurement sites along the Arkansas River. This information helps to manage the movement of water throughout the Fryngpan-Arkansas Project. This program is in its third year. Reclamation provides financial assistance to SE on a yearly basis depending on the request.

ECAO - Acreage Verification System (AVS) – RWCD -

- Through a cooperative agreement with the PRWCD development and installation of an AVS database is occurring. The AVS will allow the PRWCD to manage the use of water in the district. The database will allow queries and reports to be produced. The database is to be completed by the end of the 2002 Fiscal Year.

NKAO – Buried Pipe Program -

- The NKAO has provided technical and financial assistance to various districts to for the replacement of high loss, high maintenance sections of open ditch lateral with buried pipe. These projects reduce system water losses, improve water accounting and scheduling, and provide on-farm efficiency improvements.

NKAO – Water Measurement Improvements -

- The NKAO has provided assistance to various districts to improve the accuracy of water measurement. This includes the construction of ramp flumes at the head of canals, providing equipment for remote monitoring, portable pipe flumes for new lateral measurement sites, and purchased ultrasonic meters that Districts can use to check existing propeller meters.

NKAO – Canal Automation – Mirage Flats Irrigation District -

- Technical and financial assistance was provided to the Mirage Flats Irrigation District for canal automation. The District has currently has three automated canal sites, and numerous remote monitoring sites. Advances in automation equipment, along with increases in the number of manufacturers of this equipment, have lowered the costs of implementing these projects.

NKAO – Remote Monitoring Installations – State of Nebraska -

- NKAO has provided technical, financial, and installation assistance for the installation of remote monitoring equipment on existing and new stream gage sites along the Republican River and it's tributaries to assist the Nebraska Department of Natural Resources in administering surface water rights in the basin.

NKAO – Remote Monitoring Installations – Frenchman-Cambridge Irrigation District -

- NKAO has provided technical, financial, and installation assistance for remote monitoring equipment on wasteways and other key canal measurement sites to improve water management, accounting, and scheduling in the Frenchman-Cambridge Irrigation District in southwest Nebraska.



Remote monitoring site on Frenchman-Cambridge Irrigation District's Bartley Canal wasteway near Holbrook, Nebraska.

WYAO - Low Flow Check Structures Installation - Gering Fort-Laramie Irrigation District -

- Funds were provided for the construction of a check structure on the Fort-Laramie Canal. Completion of this project will allow the district to reduce early and late season diversions and conserve the limited water supply of the North Platte River system.

WYAO - Ramp Flume and Remote Monitoring -

Farmers Irrigation District -

Funds were provided for the construction and installation of a long-throated measurement structure, remote flow monitoring equipment, and the installation of automation equipment at the Tri-State Diversion Dam. Completion of this project will provide automation, remote monitoring, and control of diversions made into the District's main canal, the Tri-State Canal.

WYAO - Water Accounting Improvements – Pathfinder Irrigation District and Goshen Irrigation District -

- Reclamation provided financial assistance for the purchase of software to provide more effective accounting of water deliveries. The accounting program will help identify canal reaches that are candidate for seepage control.

WYAO - Midvale Irrigation District-Web Page Design with Link to the District's Water Accounting Program -

- The District had a web page designed and linked the water accounting program installed in 2001 to the web page. The link to the water accounting program will enable water users to access their water use data around the clock during the growing season.

WYAO - Midvale Irrigation District-Wind River Basin Model -

- Funds are being provided to the District for the development of a day-to-day prediction model for stream flows in the Wind River, and Bull Lake Creek feeding into Bull Lake.

WYAO – Water Measurement Improvements – Highland-Hanover Irrigation District -

- The District is to purchase and install water measuring equipment. The additional data provided by the equipment will improve the ability for District personnel to monitor, evaluate, and control the District's water uses.

WYAO – Ramp Flume – Gering Irrigation District-

- Funds are being provided for the construction and implementation of ramp flume and monitoring equipment. This will improve the District's ability to measure, monitor, and manage water received.

OTAO - Arbuckle Master Conservancy District -

- Reclamation provided financial assistance for the replacement of ten differential pressure transmitters and five leaking valves within the district's conveyance system. Installation of the new equipment will result in more accurate measurement, improved leak detection, and development of a more accurate water budget.

OTAO - Canadian River Municipal Water Authority -

- The WCFSP provided financial assistance to install 6 additional flow meters and associated telemetry equipment for water pumped from recently installed groundwater wells. The installation of flow meters will aid the Authority in the accounting for all sources of water and development of a comprehensive water budget.

OTAO - Central Oklahoma Master Conservancy District -

- In FY02, the district completed the installation of an updated telemetry system. Reclamation provided grant funding to this effort. Water savings resulting from replacement of the telemetry system will result in improving water supply for the 3 cities served by the project. In addition, the updated telemetry system will aid the district in the development of a water budget, and assist in accurately assessing delivery efficiency.

OTAO - Fort Cobb Reservoir and Master Conservancy District -

- In FY02 the district completed the installation of a new and updated telemetry system. Reclamation provided financial assistance towards this effort, with matching funds provided by the district.



OTAO - Foss Reservoir Master Conservancy District -

- Reclamation provided financial assistance for the purchase of 5 magnetic flow meters and

for replacement of the districts outdated telemetry system. District provided cost-share and in-kind labor contributions.

OTAO - Lugert-Altus Irrigation District -

- The WCFSP provided financial assistance to the district for the purchase of pipe and flow



meters for use in conversion of open laterals to low-pressure buried pipelines. The district annually budgets \$100,000 towards this effort.

OTAO - Mountain Park Master Conservancy District -

- In FY02 the WCFSP provided funding to the district for replacement of the districts outdated telemetry system. Replacement of the telemetry system will result improve the management of the district's conveyance system by making water level and flow data remotely available at the district office.

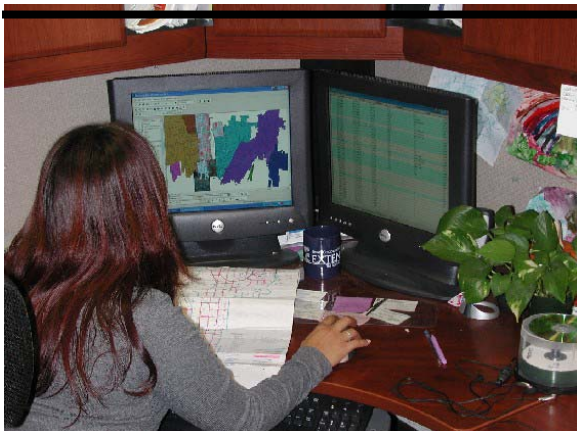
OTAO - Texas Agricultural Extension Service, Texas A&M University System -

- This agreement provided funds to help an Irrigation District Rapid Assessment Tool Development Program (RAT). The goal of

this program is to develop a complete set of procedures and tools that can be used to quickly identify the sources of water losses and potential savings for irrigation districts. Funding of this project facilitates continued development of a method for quickly identifying the sources of water losses and potential savings.

MTAO-Greenfields Irrigation District -

- MTAO provided funding to Greenfields Irrigation District to implement several water conservation measures including the automation of two canal conveyance locations and the purchase of a portable flow meter to be used by the District and the Sun River Watershed group. The District had previously automated several key control structures in the canal conveyance system.



Vision for the Great Plains Regional Water Conservation Program

VISION

In cooperation with water users, states, federal agencies, local entities and others, we in the Great Plains Region should direct our water management and conservation efforts towards helping water users identify and implement water efficiency improvements that will improve the overall beneficial uses of water and related resources.

Through proactive but judicious use of technical and financial assistance, technology transfer, and education programs, we will work in the interest of the public good by:

- Helping to remedy current problems by providing tools (education, training, outreach) to help resolve, and prevent, similar problems in the future,
- Find ways to provide water for beneficial uses which are presently not being met,
- Reducing negative impacts resulting from inefficient water operations, and
- Improving, enhancing or enlarging current benefits for present beneficiaries.

Through successful implementation of the WCFSP, we in the Great Plains Region will demonstrate to the water user community, the public, states, other partners, and staff, our capability and sincere commitment to managing and protecting the water and related resources to which we are entrusted in an environmentally and economically sound manner.